the thermal stability of the MR device acts not only as the mirror-reflective film but also acts for microcrystalline film structure control, as so mentioned hereinabove, thereby contributing to the improvement in the MR characteristics of the spin valve films 8. The MR-improving layer is not limited to be below the free layer 1. Even when disposed above the antiferromagnetic layer 6, as in Fig. 39 and Fig. 40 (MR-improving layer 4B), the layer well exhibits its functions. In those cases, the MR-improving layer 4B does not directly participate in magnetostriction control in the free layer. The MR-improving layer 4B of a laminate film composed of a plurality of metal layers 4a and 4b or of an alloy layer 4c (these 4a, 4b and 4c are mentioned hereinabove) is disposed on the antiferromagnetic layer 6 of IrMn or the like such as that mentioned above, and this acts for stabilizing the lattice spacing in the antiferromagnetic layer. As a result, dislocation on the interface of magnetic layer 2/antiferromagnetic layer 6 is prevented, whereby the thermal stability of the spin valve films 8 is much more improved.

When the lattice spacing in the antiferromagnetic layer is suitably controlled by the MR-improving layer, the other magnetization pinning characteristics of the films 8 are also improved. More effectively for the lattice spacing control, the MR-improving layer acts as the underlayer for the antiferromagnetic layer. This is especially effective in

bottom type spin valve films or dual spin valve films. Even in the films of those types, the lattice spacing in the antiferromagnetic layer could be freely and appropriately controlled by the laminated fcc metal or hcp metal film or alloy film specifically incorporated therein, whereby the magnetization pinning characteristics of the films could be improved (with respect to the magnetic coupling bias field and the thermal stability).

Where the MR-improving layer 4B of a laminate film composed of a plurality of metal films 4a and 4b is disposed on the antiferromagnetic layer 6, it is desirable that the second metal film 4b of a metal having small surface energy, such as Au or the like, is disposed to be adjacent to the antiferromagnetic layer 6. This is because, if the second metal film 4b of Au, Ag or the like is adjacent to the protective film 7 of Ta or the like, the constituent metal of Au, Ag or the like will diffuse into the protective film 7 to lower the thermal stability. Therefore, it is desirable that the first metal film 4a of Cu or the like is disposed adjacent to the protective film 7. The MR-improving layer 4B above the antiferromagnetic layer 6 may be of a laminate film of first metal film 4a/second metal film 4b/first metal film 4a.

As mentioned hereinabove, the MR-improving layer 4a of a metallic laminate film or an alloy layer is effective for reducing the magnetostriction in the free layer 1 of a Co-

based magnetic material such as Co, a CoFe alloy or the like. If the single-layered magnetic layer 1 of CoFe is subbed with only a underlayer of simple Cu, negative magnetostriction in the layer 1 will be great over -1 ppm, since the lattice spacing in the layer 1 is too small. On the other hand, if the single-layered magnetic layer 1 of CoFe is subbed with only a underlayer of simple Au, positive magnetostriction in he layer 1 will be great over +1 ppm, since the lattice spacing in the layer 1 is too large.

As opposed to those, when the MR-improving layer 4 of a metallic laminate film or alloy layer 4c that comprises at least one element selected from Cu, Au, Ag, Pt, Rh, Pd, Al, Ti, Zr, Hf and Ir is provided as the underlayer for the free layer 1 of a Co-based magnetic material such as Co, a CoFe alloy or the like, the fcc(111) orientation in the layer 1 can be improved, and, in addition, the lattice spacing in the layer 1 can be controlled to fall within a range effective for magnetostriction reduction. For example, the d(111) lattice spacing in the layer 1 can be controlled to fall between 0.2055 and 0.2085 nanometers. It is desirable that, in the MR-improving layer 4 which acts as the underlayer below the free layer 1, fcc-d(111) is larger than 0.2058 nanometers. The d-(111) lattice spacing control in the layer 4 may be effected, for example, as follows: When the layer 4 is of a laminate film of Au-Cu, the ratio of the Au thickness to the Cu thickness